

WHAT IS CLAIMED IS:

1. An exhaust gas cleaning system for an internal combustion engine, the exhaust gas cleaning system comprising:

a particulate filter disposed in an exhaust passage of the engine for collecting and accumulating particulate matters included in exhaust gas;

an operating condition detecting means for detecting an operating condition of the engine;

particulate matter accumulation quantity detecting means for detecting a quantity of the particulate matters accumulated in the particulate filter;

temperature increasing means for increasing temperature of the particulate filter;

temperature increase controlling means for operating the temperature increasing means based on detection results of the operating condition detecting means and the particulate matter accumulation quantity detecting means; and

particulate matter accumulation inhibiting means included in the temperature increase controlling means for performing an operation for inhibiting the accumulation of the particulate matters to the particulate filter when the particulate matters accumulated in the particulate filter exceeds a predetermined quantity and the engine is under a predetermined operating condition.

2. The exhaust gas cleaning system as in claim 1, wherein the temperature increase controlling means stops

temperature increasing operation performed with the temperature increasing means if an output torque of the engine is equal to or greater than a first threshold in the case where the quantity of the accumulated particulate matters exceeds the predetermined quantity,

the temperature increase controlling means performs the temperature increasing operation with the temperature increasing means if the output torque of the engine is less than the first threshold and is equal to or greater than a second threshold, which is less than the first threshold, in the case where the quantity of the accumulated particulate matters exceeds the predetermined quantity, and

the temperature increase controlling means performs an operation with the particulate matter accumulation inhibiting means if the output torque of the engine is less than the second threshold in the case where the quantity of the accumulated particulate matters exceeds the predetermined quantity, without performing the temperature increasing operation with the temperature increasing means.

3. The exhaust gas cleaning system as in claim 2, wherein the first and second thresholds are determined in accordance with rotation speed of the engine.

4. The exhaust gas cleaning system as in claim 2, wherein the temperature increase controlling means includes determining means for determining whether duration of the

operating condition of the engine in the state where the quantity of the accumulated particulate matters is greater than the predetermined quantity and the output torque of the engine is lower than the second threshold is longer than a predetermined period, and

the temperature increase controlling means performs the operation with the particulate matter accumulation inhibiting means only when the determining means determines affirmatively.

5. The exhaust gas cleaning system as in claim 1, wherein the particulate matter accumulation inhibiting means performs an operation for reducing a quantity of the particulate matters discharged from the engine.

6. The exhaust gas cleaning system as in claim 5, wherein the particulate matter accumulation inhibiting means reduces the quantity of the particulate matters discharged from the engine by reducing a quantity of exhaust gas recirculated into intake air.

7. The exhaust gas cleaning system as in claim 5, wherein the particulate matter accumulation inhibiting means reduces the quantity of the particulate matters discharged from the engine by decreasing an upper limit guard value of fuel injection quantity with respect to air intake quantity, the upper limit guard value being set in order to inhibit the discharge of the particulate matters.

8. The exhaust gas cleaning system as in claim 5, wherein the particulate matter accumulation inhibiting means reduces the quantity of the particulate matters discharged from the engine by increasing fuel injection pressure.

9. The exhaust gas cleaning system as in claim 5, wherein the particulate matter accumulation inhibiting means reduces the quantity of the particulate matters discharged from the engine by advancing fuel injection timing.

10. The exhaust gas cleaning system as in claim 1, wherein the particulate matter accumulation inhibiting means includes means for inhibiting an increase in the quantity of the particulate matters accumulated in the particulate filter by gradually combusting the accumulated particulate matters.